



# 2016 Fall Electrofishing Summary Report

## Shadow Lake (WBIC 258600)

Waupaca County

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### Introduction and Survey Objectives

In 2016, the Department of Natural Resources conducted a one night electrofishing survey of Shadow Lake in order to provide insight and direction for the future fisheries management of this water body. Primary sampling objectives of this survey were to characterize panfish species composition, relative abundance, and size structure as an experimental panfish regulation study. The following report is a brief summary of the survey, general status of the fish populations and future management options.

Acre: 44  
Lake Type: Drainage  
Regulations: During May and June, 15 panfish may be kept, but only 5 of any one species. During the remainder of the season, 25 panfish may be kept

Shoreline Miles: 1.14  
Public Access: 1 public access

Maximum Depth (feet): 38

### WISCONSIN DNR CONTACT INFO.

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### Survey Information

Site location	Survey Date	Water Temp. (F)	Target Species	Total Miles Shocked	No. of Stations	Gear	Dippers
Shadow Lake	10/4/2016	64.2	Panfish	1.02	2	Boomshocker	2

### Survey Method

- The primary objective for this survey was to count and measure panfish populations. Other gamefish may be sampled but are considered by-catch as part of this survey. In this particular survey we were collecting panfish data for the special panfish regulations that have gone into effect for roughly 100 lakes throughout Wisconsin. Shadow Lake has a regulation that during May and June, 15 panfish may be kept, but only 5 of any one species. During the remainder of the season 25 panfish may be kept.
- The entire shoreline was sampled with a boomshocker. All fish captured were identified to species and measured for length. A subsample of fish were weighed and age structures collected for age and growth analysis.
- Fish metrics used to describe fish populations include proportional stock density, catch per effort, length frequency distribution, and mean age at length.



### Fish Metric Descriptions PSD, CPUE, LFD and Growth

**Proportional Stock Density (PSD)** is an index used to describe size structure of fish. It is calculated by dividing the number of quality size fish by the number of stock size fish for a given species. PSD values in the 40 to 60 percent range generally describe a balanced fish population.

**Catch per unit effort (CPUE)** is an index used to measure fish population relative abundance which simply refers to the number of fish captured per unit of distance or time. For electrofishing surveys we typically quantify CPUE by the number and size of fish per mile of shoreline. CPUE indexes are compared to statewide data by percentiles and within lake trends. For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state.

**Length frequency distribution (LFD)** is a graphical representation of the percentage or number of fish captured by one inch size intervals. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

**Mean Age at Length** is an index used to assess fish growth. Growth structures (otoliths, spines, or scales) are collected from a specified length bin of interest (e.g. 7.0-7.5 inches for bluegill). Mean age is compared to statewide data by percentile with growth characterized by the following benchmarks: slow (<33rd percentile); moderate (33rd to 66th percentile); and fast (>66th percentile).

### Size Structure Metrics

Species	Total	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock No	Quality No	PSD	Percentile Rank	Size Rating
BLUEGILL	195	5.7	2.4 - 8.2	3.0 and 6.0	182	98	54%	75th	Moderate - High
YELLOW PERCH	14	5.8	3.5 - 8.8	5.0 and 8.0	7	3	43%	93rd	High
LARGEMOUTH BASS	81	11.4	4.1 - 19.5	8.0 and 12.0	58	43	74%	72nd	Moderate - High
PUMPKINSEED	17	4.6	3.7 - 6.6	5.0 and 8.0	17	1	6%	15th	Low

### Abundance Metrics

Species	CPUE Total (no per mile)	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Percentile Rank	Abundance Rating
BLUEGILL	262.7	85th	Moderate - High	≥ 7.0	66.0	96th	High
YELLOW PERCH	13.7	60th	Moderate	≥ 8.0	2.9	89th	Moderate - High
LARGEMOUTH BASS	79.4	93rd	High	≥ 14.0	20.5	97th	High
PUMPKINSEED	16.7	71st	Moderate - High	≥ 7.0	0	-	Low

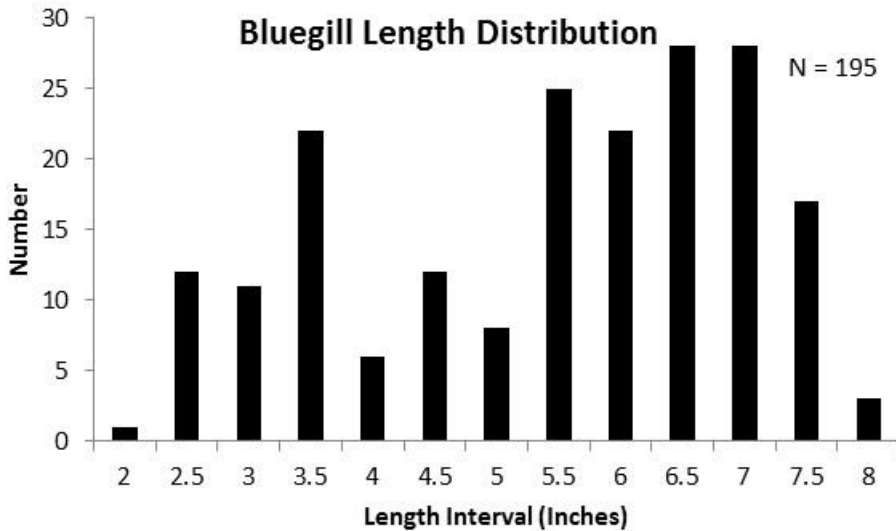


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Growth Metrics						
Species	Total (N)	Length Bin (inches)	Mean Age (years)	Age Range (years)	Percentile Rank	Growth Rating
BLUEGILL	9	6.0	5.1	4 - 7	38th	Moderate - Slow
BLUEGILL	13	7.0	5.8	5 - 7	31st	Moderate - Slow

### Summary

- A total of 404 fish in 8 species were collected during our surveys. The most frequently encountered and common species were bluegill (268), largemouth bass (81), pumpkinseed (17), yellow perch (14), and warmouth (13).
- Other fish species sampled in low abundance included greater redhorse (2), white sucker (6), and the invasive species common carp (3).
- Largemouth bass was the dominant gamefish species captured in our survey. Size structure and abundance metrics were found at moderate to high levels. The largest bass sampled was 19.5 inches and 36% of bass caught were greater than the minimum legal size limit of 14.0 inches.
- Panfish populations were comprised mainly of bluegill, pumpkinseed, and yellow perch. Moderate to high numbers of these species were captured.
- Bluegill were found in moderate to high density and showed average size structure with 54% of our catch greater than 6.0 inches and 26% greater than 7.0 inches.
- Bluegill and black crappie growth in Shadow Lake was moderate to slow when compared to data from other lakes statewide.

### Management Options

This survey was primarily intended to assess panfish populations. Other species are captured but different survey techniques are typically used to better assess their population metrics. Therefore, management recommendations below are focused on bluegill and black crappie.

#### Panfish

- Panfish size structure was found at moderate levels and growth rates were moderate to slow.
- Management Objective: Continue monitoring the fishery. Bluegill size structure in Shadow lake has the potential to increase if the larger individuals are protected from over harvest.
- Management Action: A special panfish regulation was put in place in the spring of 2016 to better protect some of the larger spawning stock.
- Fish sticks were placed on the west shore of Shadow Lake in (2014 and 2017) to provide habitat for panfish species.

#### Other Management Objectives:

- Currently, Shadow Lake is on an 8 year rotation for sampling. The lake was sampled to gather pre-regulation panfish data prior to the experimental panfish regulations that went into effect in the spring of 2016. The DNR will survey the lake again in the next 5 - 6 years to evaluate the effects of the new panfish regulations that were put into place.